

U.S. Patent Application Serial No. 10/648,356
Response filed February 17, 2006
Reply to OA dated November 17, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1 - 7 (Canceled)

Claim 8 (Currently Amended): An optical semiconductor device comprising an optical multilayer film that is located on ~~an~~ ~~a~~ light incident plane or a light emitting plane, the optical multilayer film having a laminated structure that at least includes a first layer, a second layer containing titanium oxynitride as a main component, and a third layer containing magnesium fluoride as a main component, the first layer having a different refractive index from that of the second layer or the third layer,
the laminated structure having a plurality of reflection planes,
the thickness of the third layer being smaller than 1/4 wavelength of light incident to the light incident plane or of light emitting from the light emitting plane, and
tensile stresses and compressive stresses of the first, second, and third layers substantially
canceling each other.

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Claim 9 (Original): The optical semiconductor device as claimed in claim 8, wherein the first layer and the second layer are in contact with each other.

Claim 10 (Original): The optical semiconductor device as claimed in claim 8, wherein another layer is interposed between the first layer and the second layer.

Claim 11 (Original): The optical semiconductor device as claimed in claim 8, wherein: the first layer contains magnesium fluoride; and
the second layer is sandwiched by the first layer and the third layer.

Claim 12 (Original): The optical semiconductor device as claimed in claim 8, wherein the first layer contains silicon oxide as a main component.

Claim 13 (Original): The optical semiconductor device as claimed in claim 8, wherein the optical multilayer film is a reflection preventing film or a highly reflective film.

Claim 14 (Original): The optical semiconductor device as claimed in claim 8, wherein the second layer is a layer formed by ion-assisted deposition.

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Claim 15 (Original): The optical semiconductor device as claimed in claim 8, wherein at least the light incident plane or the light emitting plane is sealed with resin.

Claim 16 (Currently Amended): An optical semiconductor device comprising an optical multilayer film that includes a plurality of layers having different refractive indices on a light incident plane or a light emitting plane,
the optical multilayer film being able to exhibit first optical reflection characteristics that are obtained by causing a refractive index difference between an outermost layer and the air or an inert gas, and second optical reflection characteristics that are obtained by not causing a refractive index difference between the outermost layer and a material existing on the external side of the outermost layer, and

the first optical reflection characteristics of the multilayer film and the second optical reflection characteristics of the multilayer film being substantially the same,
wherein tensile stresses and compressive stresses of the first, second, and third layers substantially cancel each other.

Claim 17 (Original): The optical semiconductor device as claimed in claim 16, wherein the first optical characteristics and the second optical characteristics both satisfy optical requirements of a case where another material is provided in contact with the outermost layer of the optical

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multilayer film.

Claim 18 (Original): The optical semiconductor device as claimed in claim 16, wherein the second optical characteristics are obtained by providing resin in contact with the outermost layer of the optical multilayer film.

Claim 19 (Original): The optical semiconductor device as claimed in claim 16, wherein the optical multilayer film includes a layer that contains titanium oxynitride as a main component, and a layer that contains magnesium fluoride as a main component.

Claim 20 (Original): The optical semiconductor device as claimed in claim 8, further comprising a fourth layer having a refractive index higher than that of the first layer.